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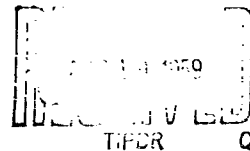
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by

Norman Reich
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CNL Technical Memorandum 33-19
Status Report
CNL Tenuersal Program
Phase B - "Pick-Up"

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ABSTRACT

(C) Object.

The object of this phase of the Traversal Program is to estimate the quantity of V-agent that can be picked up on the clothing of troops traversing contaminated areas.

(C) Results.

"Creep and crawl" trials simulating a straight-line traversal of open terrain under fire were conducted at Army Chemical Center, Maryland, on test sites where the moderately dense vegetation (80 to 90% coverage) was maintained at a height of 3 to 6 in. The quantity of simulant picked up on the U.S. Army fatigue uniforms of test subjects crawling across the area within an hour after the dispersion of simulant averaged approximately 1% of the contamination density per unit length of the traversal path (ie, $P' = 0.01 CL$; where P' is the pick-up of simulant, g; C is the contamination density, g/sq m; and L is the distance traversed, m). This relationship appeared to be independent of the particle size of the dispersed simulant, although evidence exists to show that particle size does have some effect on the transferability of simulant and agent.

A comparison of the transferability of agent to that of simulant indicated that the relative transferability of agent decreased with increasing contamination. This relationship may be expressed as $R = \exp(-0.06 C)$, where R is the ratio of agent to simulant picked up on the cloth-covered roller. The constant of this equation is an approximation based on limited data and requires substantiation by further testing.

From the foregoing it was assumed that, if V-agent were used instead of simulant in the "creep and crawl" trials, the average quantity of agent that would have been picked up could be represented by the equation $P = 0.01 CL \exp(-0.06 C)$.

The quantity of agent picked up on the cloth-covered roller traversing contaminated areas one day after the dispersion of V-agent averaged approximately 4% of that picked up when the traversal was effected within one hour after the dispersion. This reflects the apparently rapid decline in agent available for pick-up, a fact which was corroborated in CML Technical Memorandum 33-19, dated 9 February 1959, covering Phase I (Persistence) of the CML Traversal Program. (Note: The results presented are specific for a particular field activity and for essentially one type of terrain condition. Additional testing is required to provide information relative to other field activities performed on V's and other types of terrain.)

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INTERIM REPORT
CWL TRAVERSAL PROGRAM
PHASE B - "PICK-UP"

I. (C) OBJECT.

The object of this phase of the Traversal Program is to estimate the quantity of V-agent that can be picked up on the clothing of troops traversing contaminated areas.

II. (U) AUTHORITY.

This study was authorized in the Chemical Warfare Laboratories Traversal Program, dated 25 March 1957.

III. (C) INTRODUCTORY REMARKS.

To study and assess the traversal and occupational hazards of dispersed V-agent, the CWL Traversal Program was implemented by direction of the Deputy Commander for Scientific Activities, U.S. Army Chemical Warfare Laboratories. This program is divided into three related phases: Phase A - Persistence and Decontamination - determining the persistence of V-agent and factors governing this persistence; Phase B - "Pick-Up" - determining the quantity of agent transferred to personnel traversing or occupying contaminated areas; and Phase C - Casualty Production - estimating the effectiveness of "pick-up" in producing casualties. These phases are detailed in a CWL document, subject: The Casualty Producing Capability of V-agent when Dispersed as Terrain Contaminant (C), dated 25 March 1957.

This report is concerned primarily with the results of the areal traversal trials conducted under Phase B of the Traversal Program. These trials were designed to provide information relative to the transferability of V-agent to the uniforms of troops crawling across contaminated terrain (ie, simulating the traversal of open areas under fire at night). No tests employing the direct measurement of V-agent pick-up on the clothing of test subjects were considered because of the hazard to participating personnel. Therefore, the objectives of this phase of the program had to be satisfied by estimating the pick-up of V-agent from the results of Field Test No. 1924 and Test Plan No. 29 which were prepared and executed by Test Division. Field Test No. 1924 provided for the conduct of a series of "creep and crawl" trials to determine the quantity of simulant picked up on the uniforms of test subjects crawling across terrain on which simulant was disseminated in specified ranges of contamination densities and particle sizes. Test Plan No. 29 provided for a series of trials to establish (1) the relative transferability of simulant from the ground to both man and a cloth-covered roller, and (2) the relative transferability of agent and simulant from the ground to the roller. The resulting man-to-roller and agent-to-simulant data provided the basis for estimating the quantities of agent that would have been picked up by test subjects had V-agent instead of simulant been used in the "creep and crawl" trials.

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The pick-up due to other activities in the field is yet to be studied. However, as a result of a series of field trials conducted at Army Chemical Center in March 1964, a considerable quantity of such data is available. This information is reported in CRLR 500, subject: Liquid Agent Picked Up by Troops Traversing Areas Contaminated with CW Agents, dated 7 December 1955. It is planned to study the extent to which this large body of information is applicable to the present problem.

All data relative to "pick-up" accumulated since the inception of this phase of the program in July 1957 are incorporated in this report. These results and the inferences drawn therefrom are regarded as interim in character, and as such are issued for temporary or limited use only. They may be superseded when additional data are received and evaluated.

IV. (C) EXPERIMENTAL

A. "Creep and Crawl" Trials

1. Procedure

The "creep and crawl" trials, as prescribed in the test directive for Field Test No. 1024, were conducted on "B" Field, Army Chemical Center, a site selected for the uniformity of vegetation which covered about 80 to 90% of the terrain surface. This area was divided into test strips, one mile by 1/2 mile long. To insure similar terrain conditions for each trial, the grass on these strips was maintained at 1 to 2 in. In each trial, five of six test strips were contaminated with simulant (diisobutyl phthalate dyed with FZ-100, 12 Red) disseminated uniformly by means of a mechanical device. The disseminating apparatus (figure 1, appendix C) was employed for the distribution of small particles, whereas the multijet disperser (figure 2, appendix C) was employed for large particles. The uniformity of the contamination and the particle size distribution were determined from sampling cans and Mcraper placed strategically along each test strip. As soon as practicable (15 to 30 min) after the dissemination of simulant, each test strip was traversed by two test subjects*, each crawling as if he were advancing under fire along an assigned path one at a time. For this reversal, the dress consisted of U.S. Army fatigue uniforms over cotton drawers and long-sleeved undershirts; the test subjects also wore cotton gloves and helmet liners, and carried simulated (wooden) rifles. As soon as the forwarder traversal was effected, all clothing was removed, and traces of simulant on the rifles, helmet liners and skin were swabbed with solvent. The clothing and all swabs were forwarded for analysis at the close of the trial. Items of clothing were photographed and sectioned prior to being analyzed for the quantities of simulant picked up on the various parts of the uniform.

*In the last four trials, a cloth-covered roller (figure 4, appendix C), was substituted for the second test subject traversing 3 of the 6 test strips. (cf, par B 1).

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2. Results.

During the period of July 1957 through May 1958, a total of eleven "creep and crawl" trials were conducted. In these trials simulant was disseminated in densities ranging from 0.3 to 13.6 $\mu/\text{sq m}$ with particle size distributions having mass median diameters of about 20 to 3,100 microns. The data derived from these trials, representing a total of 103 individual traversals, are presented in tables 1 through 11, appendix A. Photographs of the representative distributions of simulant on clothing are included as figures 5 through 7, appendix C.

The quantity of simulant picked up on the uniforms of test subjects was found to be directly proportional to the density of the disseminated agent. The average pick-up was equal to 1% of the contamination density per unit length of the traversal path, or as alternately phrased, equal to 0.01 times the contamination density times the distance traversed (viz, for the 50-meter traversal during these "creep and crawl" trials, the average pick-up was numerically equal to one half the contamination density). This relationship, which appeared to hold equally well over the entire range of densities employed, appeared to be independent of the particle size of the dispersed agent.

In general the simulant on the uniforms was located, in descending order of contamination, on the gloves, lower abdomen, elbows, knees, forearms, upper abdomen, thighs, shins, chest, and upper arms. This distribution of simulant is presented graphically in figures 1 and 2, appendix B, and is summarized in the table below. Variations in pick-up and distribution of the simulant on uniforms were attributed to differences in the manner in which individuals crawled; these could be ascribed to the physical characteristics (ie, height and weight) of the subjects and to the traversal time.

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DISTRIBUTION OF SIMULANT ON CONTAMINATED UNIFORMS

Location	Average Percentage of Total Pick-Up
Jacket	
Chest, left	3.0
Chest, right	1.9
Upper Abdomen, left	6.5
Upper Abdomen, right	3.8
Upper Arm, left	1.3
Upper Arm, right	0.8
Elbow, left	7.6
Elbow, right	5.1
Forearm, left	6.0
Forearm, right	4.4
Trousers	
Lower Abdomen, left	8.1
Lower Abdomen, right	6.4
Thigh, left	5.7
Thigh, right	4.5
Knee, left	6.1
Knee, right	4.7
Lower Leg, left	3.4
Lower Leg, right	2.6
Gloves	
Left	8.0
Right	9.9

In three of the eleven trials, the pick-up deviated significantly from characteristic results. In trials 5 and 7 roughly half the anticipated quantity of simulant was picked up. This reduced pick-up was attributed to the frozen terrain during trial 5, and to the dead and very dry vegetation covering the area during trial 7. In trial 11 the use of a different dye in preparing the simulant was assumed responsible for the pick-up which was apparently twice the anticipated quantity.

B. "Man-Vs-Roller" Trials.

1. Procedure.

In accordance with Test Plan No. 29, as amended, the test site on Graces quarters was divided into 20 adjacent test strips, 2 meters by 25 meters, which were numbered consecutively. To eliminate grass height as a variable in these trials, the grass was mowed to 3 in. on days of test. On the ten

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odd-numbered strips simulant (dibutyl phthalate dyed red) was disseminated uniformly in a specified range of densities in both large and small particle sizes. Large droplet sizes (about 3,000 microns) were generated by the multijet disperser (figure 2, appendix C); small particle sizes (about 500 microns), by the same device equipped with air-operated spray nozzles (figure 3, appendix C). As soon as practicable after the dissemination of simulant (ie, about 15 min, the time to collect the contents of sampling pans used to check the uniformity of dispersion), each test strip was traversed as in the "creep and crawl" trials described in par A, 1, above, however, with the cloth-covered roller substituting for the second test subject. The quantities of simulant picked up on both clothing and cloth of the roller were determined. (Note: One test subject was employed throughout these trials. His selection for these trials was based on a cursory review of "creep and crawl" data which indicated that his manner of crawling resulted in pick-up most representative of the average of all test subjects.)

2. Results.

The results of these ten trials conducted in June 1958 to establish the relative transferability of simulant from terrain to the uniform of a crawling test subject and to the cloth-covered roller are presented in tables 12 and 13, appendix A. These tables also include supplementary data derived from "creep and crawl" trials (see footnote p b).

The average quantity of simulant picked up on the uniform of the test subject was somewhat in excess of 1% of the contamination density per unit length of the traversal path. This pick-up was not significantly different from the results derived from "creep and crawl" trials conducted on "M" Field (cf par A, 2, above).

A good correlation was obtained between the comparative quantities of simulant picked up by man and the cloth-covered roller; ie, ratio of simulant picked up by the roller to that picked up by man appeared to be essentially constant and independent of particle size. The same relationship was found in the supplementary trials conducted in conjunction with "creep and crawl" tests on "M" Field.

Figure 3, appendix B, indicates that smaller particles are somewhat more transferable from the terrain to cloth than are the larger particles. This relationship between particle size and pick-up was not detectable from "creep and crawl" data because of the overshadowing effects of minor differences in crawling techniques of individual test subjects, and differences in terrain characteristics during the 10-mo test period.

C. "Agent-Vs-Simulant" Trials.

1. Procedure.

As prescribed in Test Plan No. 29, the trials described in par B, 1, above, were rerun on the even-numbered test strips with VX substituted for

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simulant and with the traversal of the strips by test subjects eliminated. As soon as practicable after the dispersion of toxic agent, the roller, covered with two layers of cotton sateen cloth, was rolled along the left side of the strip. In a like manner, the right side of the strip was traversed by the roller on the following day. In both cases, as soon as the traversal was effected, each layer of cloth was removed from the roller and analyzed for agent picked-up. The procedure of analysis used was the DB3 method.

2. Results.

The results of 10 trials conducted in July and August 1958 to determine the quantity of V-agent picked up from contaminated terrain by the cloth-covered roller are included as table 14, appendix A.

When the quantity of agent picked up on the roller traversing the test strip within an hour after contamination was compared with the quantity of simulant picked up under similar conditions in trials described in par B, above, it was found that the relative transferability of agent decreased with increasing contamination. This relationship is graphically depicted in figure 4, appendix B, where the ratio of agent to simulant pick-up is plotted against contamination density on semi-logarithmic paper to produce a straight line whose equation is $R = \exp(-0.06 C)$; where R is the ratio of agent to simulant pick-up; and C, the contamination density in g/sq m. This line was based on limited data, and the equation, therefore, requires substantiation by further testing.

As was the case with simulant, agent disseminated in smaller particles was picked up somewhat more efficiently by the roller on the first traversal than was agent disseminated in the larger droplets. Whereas the pick-up of simulant was found to be directly proportional to the contamination density (within test limits), the pick-up of agent leveled off or became less efficient with increasing ground contamination.

The penetration of agent from the top layer of cloth to the under layer was not significant during the first traversal, amounting to an average of about 2%. However, on the second traversals of trials 6 through 10 performed on wet terrain, the increased percentage of agent on the undercloth indicated the aid to penetration provided by moisture.

The quantity of agent picked up on the roller traversing the contaminated area one day after the dispersion of V-agent was found to average approximately 4% of that picked up on a roller traversing the area within an hour after contamination is effected. This indicates the rapid decline in agent available for transfer to troops traversing the area.

V. (C) DISCUSSION.

The over-all objective of the Traversal Program is the estimation of the casualty producing capabilities of V-agent dispersed as a ground contaminant. The performance of the trials covered in this report provided agent pick-up data which, when coupled with information relative to the percutaneous toxicity of the agent and its penetration through treated and untreated fabrics, permit an estimation of

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APPENDIX A

TABULATED DATA

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Date: 15 July 1957

TABLE 1
ONEP AND CRACK TOTAL NO. 1

Task Subject	A	B	C	D	E	F	G	H	I	J
Height (in.)	71	59	75	67	70	71	67	69	65	69
Weight (lb.)	165	135	175	145	170	210	135	175	150	185
Uniform No.	0338	0330	0315	0315	0335	0338	0335	0335	0335	0335
Contamination density (g./sq. m.)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Particle size (μm)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Interval time (min. - sec.)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Location of Picked-up	Simulant Picked up (eq.) on Various Sections of Uniform									
Head										
Count, left	3	3	2	10	2	2	7	0	2	6
Chest, right	4	3	2	7	0	0	5	0	3	6
Upper abdomen, left	7	13	5	9	4	6	8	17	3	6
Upper abdomen, right	10	4	5	7	2	3	8	14	0	6
Upper arm, left	0	0	0	0	0	0	0	0	0	0
Upper arm, right	0	0	0	0	0	0	0	0	0	0
Elbow, left	6	6	7	7	6	5	10	11	15	9
Elbow, right	3	5	5	4	1	1	7	3	2	3
Forearm, left	7	7	12	4	1	1	11	8	5	13
Forearm, right	2	6	9	5	2	1	7	4	7	9
Torso										
Lower abdomen, left	11	8	16	6	12	3	9	17	2	6
Lower abdomen, right	12	1	9	11	12	7	15	14	11	10
Thigh, left	9	4	16	5	9	10	13	15	8	7
Thigh, right	6	3	13	5	7	7	8	13	6	7
Knee, left	6	7	10	1	7	7	7	8	8	6
Knee, right	6	7	5	6	7	6	7	8	8	6
Lower leg, left	0	1	1	6	0	5	0	5	3	0
Lower leg, right	0	2	0	6	0	0	1	5	1	0
Slaves										
Left	16	13	2	15	11	11	26	13	13	12
Right	16	15	6	11	8	13	26	13	11	16
Miscellaneous										
Rifle	3.2	3.4	0.5	2.3	2.4	0.4	1.8	2.9	1.1	0.9
Knife	0.7									
Gloves, left	0.6									
Gloves, right										
TOTAL	127	116	124	130	90	100	195	186	108	189
Pick-up Factor**	0.770	0.703	0.719	0.754	0.554	0.615	1.214	1.220	0.732	0.875

*Total quantity of simulant picked up on jacket, trousers, and gloves.
**Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of traversal.

Remarks

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TABLE 1
CREEP AND GRUNT TABLE NO. 1

Date: 15 July 1957

Test Subject	A	B	C	D	E	F	G	H	I	J
Height (in.)	71	69	75	67	70	71	67	69	65	69
Weight (lb.)	165	155	175	145	190	240	175	175	155	155
Uniform No.	0330	0330	0335	0315	0335	0385	0335	0305	0335	0335
Contamination weight (g./sq. cm.)	560	560	505	530	535	555	535	535	535	535
Particle size (μ)	5-50	5-50	5-50	5-50	5-50	5-50	5-50	5-50	5-50	5-50
Location of Pick-up	Simulant Picked up (No. of Particles Settling on Uniform)									
Location	Simulant									
Chest, left	3	1	2	12	2	2	7	0	2	6
Chest, right	4	2	3	9	0	6	5	0	0	6
Upper abdomen, left	7	1	3	7	0	3	8	0	0	6
Upper abdomen, right	10	0	0	0	0	0	0	0	0	0
Upper arm, left	0	0	0	0	0	0	0	0	0	0
Upper arm, right	0	0	0	0	0	0	0	0	0	0
Elbow, left	0	0	0	0	0	0	0	0	0	0
Elbow, right	0	0	0	0	0	0	0	0	0	0
Forearm, left	2	7	5	1	1	1	1	0	2	2
Forearm, right	2	6	9	5	2	1	7	0	3	9
Thighs										
Lower abdomen, left	11	2	16	6	12	2	9	17	0	6
Lower abdomen, right	17	1	9	11	12	7	15	17	0	20
Thigh, left	9	0	12	5	12	10	13	16	0	1
Thigh, right	9	0	10	5	12	7	13	16	0	1
Knee, left	6	0	3	6	3	7	7	8	0	0
Knee, right	6	0	3	6	3	7	7	8	0	0
Lower leg, left	0	0	0	0	0	0	0	0	0	0
Lower leg, right	0	0	0	0	0	0	0	0	0	0
Glves										
Left	16	13	2	15	11	11	26	13	12	12
Right	16	15	6	11	8	13	28	12	11	16
Shoelaces										
Shoelace	3.2	3.4	0.5	0.3	2.4	0.0	1.3	2.9	1.1	0.9
Shoelace	0.7	0.6	0.8	0.8	1.8	0.4	3.8	2.9	0.5	1.0
Shoelace	0.6	0.6	0.8	0.8	1.8	1.4	3.4	2.9	1.8	1.0
TOTAL	127	116	124	130	90	150	185	186	106	189
Pick-up factor	0.775	0.793	0.719	0.754	0.554	0.615	1.214	1.220	0.732	0.875

Remarks:

*Total quantity of simulant picked up on jacket, trousers, and gloves.

**Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of traversal.

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TABLE 2
GRAVE AND GRAVE DATA, NO. 2

15 July 1957

Test Subject	A	B	C	D	E	F	G	H	I
Height (in.)	75	71	67	67	70	71	69	69	65
Weight (lb.)	135	105	105	105	130	210	135	135	150
Uniform No.	10	14	14	56	50	17	15	15	51
Contamination Density (g./sq. m.)	1.64	1.64	2.24	2.24	1.95	1.71	1.71	1.71	5.55
Particle Size (μ, μ m)	5.5	5.5	5.5	5.5	1.15	1.15	1.15	1.15	1.15
Interval Time (min. - sec.)	2-51	2-20	2-56	2-56	2-22	2-54	2-52	2-15	2-18
Location of Pick-up									
Jacket									
Chest, left	6	17	101	39	50	56	25	105	59
Chest, right	7	15	62	39	31	62	52	30	26
Upper abdomen, left	20	35	69	67	61	84	70	177	67
Upper abdomen, right	20	16	32	33	10	9	77	60	60
Upper arm, left	2	2	26	27	13	12	9	77	60
Upper arm, right	2	2	26	27	13	12	9	77	60
Elbow, left	20	34	62	78	50	11	24	187	21
Elbow, right	27	21	14	67	73	31	51	187	21
Forearm, left	66	15	149	172	105	31	51	187	21
Forearm, right	58	30	157	63	39	55	54	119	315
Thighs									
Lower abdomen, left	62	13	91	76	72	134	84	246	118
Lower abdomen, right	13	68	57	77	85	112	80	98	263
Thigh, left	80	59	58	67	135	112	50	129	259
Thigh, right	52	37	14	32	36	77	18	53	113
Knee, left	77	30	14	32	60	35	33	53	113
Knee, right	34	27	14	32	28	32	33	53	113
Lower leg, left	34	21	14	24	79	17	61	119	117
Lower leg, right	30	29	15	22	23	20	60	119	117
Shoes									
Left	55	68	57	77	85	233	75	294	202
Right	57	59	54	67	135	93	102	118	202
Miscellaneous									
Knife	5	9	6	11	12	12	12	17	32
Underwear									
Girt, left	2.6	0.3	0.4	0.0	0.1	3.3	0.2		0.4
Girt, right	2.6	1.8	0.5	3.0		8.4	8.2		11.3
Skin		0.1	0.2	1.9	0.6	1.9	0.1	0.7	1.0
TOTAL	767	673	1137	1072	1337	1122	1150	2553	2818
Pick-up Factors**	2.936	0.522	1.069	0.557	1.064	1.663	1.346	0.919	1.025
REMARKS:									

*Total quantity of simulant picked up on jacket, trousers, and gloves.
**Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of traversal.

CONFIDENTIAL

TABLE 2

CRAP AND GROUND TRIP, NO. 2

14 July 1957

Left Subject	6	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65	67	69	71	73	75	77	79	81	83	85	87	89	91	93	95	97	99	101	103	105	107	109	111	113	115	117	119	121	123	125	127	129	131	133	135	137	139	141	143	145	147	149	151	153	155	157	159	161	163	165	167	169	171	173	175	177	179	181	183	185	187	189	191	193	195	197	199	201	203	205	207	209	211	213	215	217	219	221	223	225	227	229	231	233	235	237	239	241	243	245	247	249	251	253	255	257	259	261	263	265	267	269	271	273	275	277	279	281	283	285	287	289	291	293	295	297	299	301	303	305	307	309	311	313	315	317	319	321	323	325	327	329	331	333	335	337	339	341	343	345	347	349	351	353	355	357	359	361	363	365	367	369	371	373	375	377	379	381	383	385	387	389	391	393	395	397	399	401	403	405	407	409	411	413	415	417	419	421	423	425	427	429	431	433	435	437	439	441	443	445	447	449	451	453	455	457	459	461	463	465	467	469	471	473	475	477	479	481	483	485	487	489	491	493	495	497	499	501	503	505	507	509	511	513	515	517	519	521	523	525	527	529	531	533	535	537	539	541	543	545	547	549	551	553	555	557	559	561	563	565	567	569	571	573	575	577	579	581	583	585	587	589	591	593	595	597	599	601	603	605	607	609	611	613	615	617	619	621	623	625	627	629	631	633	635	637	639	641	643	645	647	649	651	653	655	657	659	661	663	665	667	669	671	673	675	677	679	681	683	685	687	689	691	693	695	697	699	701	703	705	707	709	711	713	715	717	719	721	723	725	727	729	731	733	735	737	739	741	743	745	747	749	751	753	755	757	759	761	763	765	767	769	771	773	775	777	779	781	783	785	787	789	791	793	795	797	799	801	803	805	807	809	811	813	815	817	819	821	823	825	827	829	831	833	835	837	839	841	843	845	847	849	851	853	855	857	859	861	863	865	867	869	871	873	875	877	879	881	883	885	887	889	891	893	895	897	899	901	903	905	907	909	911	913	915	917	919	921	923	925	927	929	931	933	935	937	939	941	943	945	947	949	951	953	955	957	959	961	963	965	967	969	971	973	975	977	979	981	983	985	987	989	991	993	995	997	999	1001	1003	1005	1007	1009	1011	1013	1015	1017	1019	1021	1023	1025	1027	1029	1031	1033	1035	1037	1039	1041	1043	1045	1047	1049	1051	1053	1055	1057	1059	1061	1063	1065	1067	1069	1071	1073	1075	1077	1079	1081	1083	1085	1087	1089	1091	1093	1095	1097	1099	1101	1103	1105	1107	1109	1111	1113	1115	1117	1119	1121	1123	1125	1127	1129	1131	1133	1135	1137	1139	1141	1143	1145	1147	1149	1151	1153	1155	1157	1159	1161	1163	1165	1167	1169	1171	1173	1175	1177	1179	1181	1183	1185	1187	1189	1191	1193	1195	1197	1199	1201	1203	1205	1207	1209	1211	1213	1215	1217	1219	1221	1223	1225	1227	1229	1231	1233	1235	1237	1239	1241	1243	1245	1247	1249	1251	1253	1255	1257	1259	1261	1263	1265	1267	1269	1271	1273	1275	1277	1279	1281	1283	1285	1287	1289	1291	1293	1295	1297	1299	1301	1303	1305	1307	1309	1311	1313	1315	1317	1319	1321	1323	1325	1327	1329	1331	1333	1335	1337	1339	1341	1343	1345	1347	1349	1351	1353	1355	1357	1359	1361	1363	1365	1367	1369	1371	1373	1375	1377	1379	1381	1383	1385	1387	1389	1391	1393	1395	1397	1399	1401	1403	1405	1407	1409	1411	1413	1415	1417	1419	1421	1423	1425	1427	1429	1431	1433	1435	1437	1439	1441	1443	1445	1447	1449	1451	1453	1455	1457	1459	1461	1463	1465	1467	1469	1471	1473	1475	1477	1479	1481	1483	1485	1487	1489	1491	1493	1495	1497	1499	1501	1503	1505	1507	1509	1511	1513	1515	1517	1519	1521	1523	1525	1527	1529	1531	1533	1535	1537	1539	1541	1543	1545	1547	1549	1551	1553	1555	1557	1559	1561	1563	1565	1567	1569	1571	1573	1575	1577	1579	1581	1583	1585	1587	1589	1591	1593	1595	1597	1599	1601	1603	1605	1607	1609	1611	1613	1615	1617	1619	1621	1623	1625	1627	1629	1631	1633	1635	1637	1639	1641	1643	1645	1647	1649	1651	1653	1655	1657	1659	1661	1663	1665	1667	1669	1671	1673	1675	1677	1679	1681	1683	1685	1687	1689	1691	1693	1695	1697	1699	1701	1703	1705	1707	1709	1711	1713	1715	1717	1719	1721	1723	1725	1727	1729	1731	1733	1735	1737	1739	1741	1743	1745	1747	1749	1751	1753	1755	1757	1759	1761	1763	1765	1767	1769	1771	1773	1775	1777	1779	1781	1783	1785	1787	1789	1791	1793	1795	1797	1799	1801	1803	1805	1807	1809	1811	1813	1815	1817	1819	1821	1823	1825	1827	1829	1831	1833	1835	1837	1839	1841	1843	1845	1847	1849	1851	1853	1855	1857	1859	1861	1863	1865	1867	1869	1871	1873	1875	1877	1879	1881	1883	1885	1887	1889	1891	1893	1895	1897	1899	1901	1903	1905	1907	1909	1911	1913	1915	1917	1919	1921	1923	1925	1927	1929	1931	1933	1935	1937	1939	1941	1943	1945	1947	1949	1951	1953	1955	1957	1959	1961	1963	1965	1967	1969	1971	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001	2003	2005	2007	2009	2011	2013	2015	2017	2019	2021	2023	2025	2027	2029	2031	2033	2035	2037	2039	2041	2043	2045	2047	2049	2051	2053	2055	2057	2059	2061	2063	2065	2067	2069	2071	2073	2075	2077	2079	2081	2083	2085	2087	2089	2091	2093	2095	2097	2099	2101	2103	2105	2107	2109	2111	2113	2115	2117	2119	2121	2123	2125	2127	2129	2131	2133	2135	2137	2139	2141	2143	2145	2147	2149	2151	2153	2155	2157	2159	2161	2163	2165	2167	2169	2171	2173	2175	2177	2179	2181	2183	2185	2187	2189	2191	2193	2195	2197	2199	2201	2203	2205	2207	2209	2211	2213	2215	2217	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TABLE 2

CPSC AND OSHA FIELD NO. 2

18 July 1967

Test Subject	H	I	C	S	F	B	U	U	F	A
Height (in.)	69	65	75	70	71	69	67	67	67	71
Weight (lb.)	175	150	195	180	210	155	165	135	135	185
Uniform No.	69	65	43	68	66	45	70	6	6	11
Contamination Density (g./sq.in.)	2.33	9.33	11.5	11.5	11.4	11.4	9.76	9.76	12.2	12.2
Particle Size (µ, MMD)	265	365	385	395	365	385	385	385	380	390
Inhalation Flow (min. - sec.)	6-12	7-19	5-19	5-26	3-9	3-11	3-23	2-13	3-10	5-10

Simulant Picked up (µg.) on Various Sections of Uniform

Location of Pick-up	1	2	3	4	5	6	7	8	9	10
Neck										
Chest, left	212	36	85	326	261	236	330	185	335	296
Chest, right	140	21	115	173	107	119	119	273	214	396
Upper Abdomen, left	280	24	230	248	183	180	184	215	514	505
Upper Abdomen, right	275	50	160	711	397	180	186	284	517	288
Upper Arm, left	25	9	62	61	220	62	189	60	132	314
Upper Arm, right	184	232	43	291	37	81	182	40	135	772
Elbow, left	160	65	219	291	352	126	207	163	303	415
Elbow, right	297	209	110	329	180	220	207	111	303	277
Forearm, left	151	207	195	329	623	235	383	213	187	272
Forearm, right			159	213	253	91	353	136	189	158
From arms										
Lower Abdomen, left	145	146	732	117	726	219	376	185	746	382
Lower Abdomen, right	179	151	732	636	567	298	388	475	605	156
Thigh, left	306	157	217	260	442	84	134	136	393	61
Thigh, right	114	84	225	234	233	130	118	159	278	282
Knee, left	114	82	225	234	233	130	118	159	278	282
Knee, right	8	37	225	234	233	130	118	159	278	282
Lower Leg, left	219	111	117	156	164	86	209	101	131	139
Lower Leg, right	111	90	161	154	795	149	136	189	151	136
Glases										
Left	315	306	15	110	360	506	762	600	867	586
Right	176	267	217	140	730	530	366	856	351	1044
Miscellaneous										
Rifle	25		37	24	34		40	76	54	92
Underwear										
Cuff, left	0.8	73	11.4	76.0	0.8		5.0	3.6		1.9
Cuff, right	51.6		1.1	129.0	cal			52.6	2.0	13.6
Shin										
Left	0.1	1.4	1.1	2.1	4.2	0.5	7.7	2.7	5.1	0.6
TOE										
Left	1.71	233	5199	5050	7331	3844	6244	1551	5218	7450
Pick-up Packages										
Left	1.035	0.439	0.904	0.879	1.091	0.673	1.274	0.936	1.359	1.222

1. Total quantity of simulant picked up on jacket, trousers, and gloves.
 2. Pick-up factor equals percent of the total contamination picked up on the uniform per section of uniform.

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TABLE 3

PROB. AND ORNL TOTAL NO. 3

18 July 1957

Test Subject	A	B	C	D	E	F	G	H	I	J
Age (yrs.)	69	65	75	70	69	71	67	71	69	69
Height (in.)	175	150	175	180	155	210	165	165	135	135
Weight (lb.)	69	55	143	68	44	66	70	44	17	17
Waistline No.	933	933	115	115	115	115	9.76	12.2	12.2	12.2
Contamination Density (g./sq.in.)	365	365	365	365	365	365	365	365	365	365
Particle Size (μ, std)	6-12	7-13	5-19	5-26	3-11	3-9	3-23	3-40	3-40	3-40
Average Size (μ, std)	6-12	7-13	5-19	5-26	3-11	3-9	3-23	3-40	3-40	3-40

Simulant Picked H (mg.) on Various Locations of Uniform

Location of Pick-up	A	B	C	D	E	F	G	H	I	J
Trunk										
Chest, left	213	36	85	170	214	726	376	105	188	296
Chest, right	175	24	115	213	217	567	119	605	201	396
Upper Abdomen, left	146	52	175	213	217	567	119	605	201	396
Upper Abdomen, right	280	34	170	211	217	567	119	605	201	396
Upper Arm, left	275	50	172	211	217	567	119	605	201	396
Upper Arm, right	125	47	172	211	217	567	119	605	201	396
Elbow, left	134	47	172	211	217	567	119	605	201	396
Elbow, right	130	47	172	211	217	567	119	605	201	396
Forearm, left	130	47	172	211	217	567	119	605	201	396
Forearm, right	151	207	157	213	217	567	119	605	201	396
Thighs										
Lower Abdomen, left	113	116	112	117	726	376	105	188	296	296
Lower Abdomen, right	179	154	175	213	567	119	605	201	396	396
Thigh, left	300	159	217	260	642	180	134	134	134	134
Thigh, right	114	84	213	213	213	180	134	134	134	134
Knee, left	114	77	213	213	213	180	134	134	134	134
Knee, right	69	77	213	213	213	180	134	134	134	134
Lower Leg, left	219	54	175	154	180	180	134	134	134	134
Lower Leg, right	111	54	175	154	180	180	134	134	134	134
Gloves										
Left	315	306	75	117	365	730	75	867	600	576
Right	175	217	717	110	730	730	75	867	600	576
Miscellaneous										
Rifle	25	37	37	24	34	34	16	54	76	92
Underwear										
Cuff, left	0.8	73	11.4	26.0	0.8	0.8	5.40	2.0	3.6	1.2
Cuff, right	51.6	73	1.1	129.0	6.4	6.4	52.6	2.0	3.6	1.2
Skin										
TOTALS	1.71	2332	5199	5450	7331	3844	6211	8218	1551	7150
Pick-up Factors	1.05	0.99	0.99	0.97	1.291	0.672	1.270	1.359	0.996	1.222

Total quantity of simulant picked up on gloves, trousers, and gloves.
Pick-up factor equals percent of the dry contamination picked up on the uniform per unit of uniform.

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*Total quantity of smelter picked up on jacket, trousers, and gloves.
**Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of travel.

TABLE 4

PICK-UP AND CRAWL TRAIL NO. 1

22 October 1957

Test Subject	A	B	C	D	E	F	G	H	I	J
Height (in.)	69	69	75	69	67	71	70	69	60	71
Weight (lb.)	175	185	195	155	165	210	190	220	160	145
Uniform No.	84	82	21	24	27	51	85	83	25	28
Contamination Density (g./sq. in.)	2.67	2.67	0.91	0.91	1.21	1.28	1.06	1.07	2.00	2.00
Particle Size (μ, 40%)	595	595	605	605	590	590	660	660	770	770
Traversal Time (sec.)	2-0	2-10	1-25	1-35	2-20	2-45	2-20	2-15	2-30	2-20
Location of Pick-Up										
Simulant Picked Up (g.) on Various Sections of Uniform										
Jacket										
Chest, left	55	114	16	21	13	21	12	35	18	21
Chest, right	24	65	17	24	22	27	71	11	11	17
Upper Arm, left	181	110	11	21	19	19	71	150	15	37
Upper Arm, right	70	75	13	19	13	20	4	90	36	20
Lower Arm, left	0	0	0	0	6	0	0	0	5	0
Lower Arm, right	0	0	0	0	0	0	0	0	0	0
Wrist, left	139	74	15	25	46	19	47	74	12	19
Wrist, right	22	125	23	7	11	25	63	64	33	27
Cuff, left	40	170	20	17	37	30	136	114	26	61
Cuff, right	30	51	12	12	15	19	62	36	37	37
Trousers										
Upper Thigh, left	104	106	10	28	45	20	155	124	72	62
Upper Thigh, right	113	128	33	25	17	17	194	69	60	46
Thigh, left	94	65	7	21	29	15	94	56	79	34
Thigh, right	31	49	29	11	12	27	47	47	11	50
Knee, left	172	69	21	25	52	11	117	111	77	73
Knee, right	96	34	12	13	15	34	66	96	60	55
Lower Leg, left	50	47	16	15	17	15	50	12	37	19
Lower Leg, right	24	58	12	13	15	12	30	45	32	11
Gloves										
Left	77	101	12	25	22	24	57	71	100	28
Right	77	62	33	11	16	15	45	85	75	75
Shoes										
Left	2	4	1	1	2	3	4	2	2	2
Right										
Left	1.8	5.3	2.7	0.7	1.5	0.4	4.1	1.6	2.4	1.8
Right	2.2	2.0	2.7	0.4	0.6	1.9	1.1	2.1	2.3	3.1
Total*	1477	1712	394	368	493	432	1342	1102	1045	844
Pick-Up Factor**	1.106	1.252	0.838	0.863	0.770	0.675	0.878	0.917	1.035	0.832

REMARKS:

*Total quantity of simulant picked up on jacket, trousers, and gloves.

**Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of traversal.

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TABLE 5

CREEP AND CRAWL TRIAL NO. 5

10 February 1953

Simulant Picked up (w. %) on Various Sections of Uniform									
Test Subject	H	W	U	C	F	I	T	S	L
Height (in.)	69	67	75	67	67	69	72	70	70
Weight (lb.)	155	125	125	135	135	200	170	200	200
Uniform No.	8	7	6, 7, 8	5, 6, 7, 8	6, 7, 8	6, 7, 8	7, 8	7, 8	7, 8
Contamination: Density (g./sq. in.)	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06
Particle Size (in. μ)	1550	1550	1550	1550	1550	1550	1550	1550	1550
Transfer: Time (min. - sec.)	3-12	4-22	3-30	3-30	3-30	3-40	3-33	3-40	3-40
Location of Pick-up									
Jacket									
Chest, left	8	5	39	4	5	91	9	15	15
Chest, right	9	31	31	3	6	13	6	6	6
Upper Abdomen, left	14	105	105	24	11	206	36	31	31
Upper Abdomen, right	23	175	175	2	12	101	12	12	12
Upper Arm, left	8	6	6	5	1	32	10	10	10
Upper Arm, right	15	55	55	13	4	9	6	4	4
Lower Arm, left	27	22	205	17	70	202	100	92	92
Lower Arm, right	26	19	19	15	79	79	51	97	97
Forearm, left	15	55	55	77	95	129	61	70	70
Forearm, right	55	106	106	94	179	54	19	109	109
Trousers									
Lower Abdomen, left	100	119	110	121	98	380	226	185	185
Lower Abdomen, right	93	100	210	210	133	79	56	81	81
Thigh, left	12	137	58	86	107	109	132	116	116
Thigh, right	18	117	67	112	38	117	51	130	130
Knee, left	27	86	70	61	101	204	79	87	87
Knee, right	11	25	15	86	118	103	66	69	69
Lower Leg, left	11	27	15	95	22	56	55	88	88
Lower Leg, right	11	27	15	95	22	31	23	29	29
Gloves									
Left	64	13	123	137	61	162	64	60	60
Right	67	89	106	149	92	135	89	57	57
Miscellaneous									
Rifle	6	3	7	5	4	10	3	6	6
Underwear									
Cuff, left					1	2	1	1	1
Cuff, right					10	1	8	1	1
Elbow					126	85	7		
Skin			0.4		0.1	0.3		0.4	
TOTAL	719	882	1582	1523	1202	2700	1175	1350	1350
Pick-up Factor**	0.254	0.311	0.503	0.164	0.364	0.616	0.331	0.393	0.393
REMARKS:									

NOTE: Trial performed on frozen terrain at ground temperature 0°F.

*Total quantity of simulant picked up on jacket, trousers, and gloves.

**Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of interval.

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TABLE 5

CREEP AND CRAWL TRIAL NO. 5

10 February 1958

Test Subject	B	M	C	C	N	K	O	E
Height (in.)	69	72	67	75	67	69	72	70
Weight (lb.)	155	200	135	135	135	200	190	180
Uniform No.	8	77	7	57	78	63	87	86
Contamination Density (g./sq. in.)	5.66	5.66	6.29	6.29	6.59	6.59	7.09	7.09
Particle Size (μ, M.D)	1550	1500	1100	1400	1100	1100	1300	1300
Traversal Time (min. - sec.)	3-12	4-22	3-18	3-30	5-10	5-40	4-18	4-18

Location of Pick-Up

Simulant Picked up (μg.) on Various Sections of Uniforms

Jacket								
Chest, left	8	5	39	4	5	31	9	15
Chest, right	9	3	31	3	8	43	6	18
Upper Abdomen, left	11	21	105	24	11	206	36	31
Upper Abdomen, right	23	14	175	26	25	101	12	45
Upper Arm, left	8	4	6	5	1	32	10	35
Upper Arm, right	15	5	55	13	4	9	6	4
Elbow, left	26	32	105	17	49	302	100	92
Elbow, right	26	27	49	45	70	79	51	97
Forearm, left	45	24	55	77	95	129	61	70
Forearm, right	55	29	106	98	179	54	49	109
Trousers								
Lower Abdomen, left	100	119	110	171	98	380	276	185
Lower Abdomen, right	83	100	210	210	173	79	50	83
Thigh, left	40	89	52	86	109	309	134	116
Thigh, right	42	117	58	112	38	117	51	130
Knee, left	18	51	67	61	171	284	79	87
Knee, right	27	88	90	67	112	103	66	69
Lower Leg, left	11	25	45	86	22	54	55	88
Lower Leg, right	11	27	45	95	22	31	23	29
Gloves								
Left	64	13	123	137	61	162	64	60
Right	67	59	106	128	92	135	89	37
Miscellaneous								
Rifle	6	3	7	5	4	10	3	6
Underwear								
Cuff, left					1	2	1	1
Cuff, right					10	1	8	1
Elbow					126	85	7	
Skin			0.4		0.2	0.3		0.4
TOTAL*	719	882	1582	1523	1202	2700	1175	1350
Pick-Up Factor**	0.254	0.311	0.503	0.684	0.364	0.814	0.331	0.381

REMARKS:

NOTE# Trial performed on frozen terrain at ground temperature 0°F.

*Total quantity of simulant picked up on jacket, trousers, and gloves.

**Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of traversal.

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CHECK AND CRAWL TRIAL NO. 5

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TABLE 6

CREEP AND CRAWL TRIAL NO. 6

11 February 1958

Test Subject	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
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Simulant Picked up (%) on Various Sections of Uniforms

Location of Pick-up

Jacket

Chest, left
Chest, right
Upper Abdomen, left
Upper Abdomen, right
Upper Arm, left
Upper Arm, right
Elbow, left
Elbow, right
Forearm, left
Forearm, right

Trousers

Lower Abdomen, left
Lower Abdomen, right
Thigh, left
Thigh, right
Knee, left
Knee, right
Lower leg, left
Lower leg, right

Gloves

Left
Right

Stollens

Boots

Underwear

Cuff, left
Cuff, right

Skin

Toilets

Pick-up Factor**

REMARKS:

*Total quantity of simulant picked up on jacket, trousers, and gloves.
**Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of traversal.

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TABLA 6

CRISP AND GRANT TRIAL NO. 6

11 February 1953

Test Subject	D	C	U	Y	Z	X	W	V	U	T	S	R	Q	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A
Height (in.)	67	75	67	68	72	69	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
Weight (lb.)	165	155	135	136	180	200	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
Uniform No.	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Contamination Density (g./sq. in.)	6.00	6.00	5.50	5.50	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
Particle Size (μ, 50%)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Transferal Time (min. - sec.)	3-00	4-23	6-00	7-43	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00	1-00

Simulant Picked-up (cc.) on Various Sections of Uniforms

Location of Pick-up

Jeans

Trousers

Lower Abdomen, left

Lower Abdomen, right

Thigh, left

Thigh, right

Knee, left

Knee, right

Lower Leg, left

Lower Leg, right

Shoe, left

Shoe, right

Upper Arm, left

Upper Arm, right

Elbow, left

Elbow, right

Forearm, left

Forearm, right

Chest, left

Chest, right

Upper Abdomen, left

Upper Abdomen, right

Waist, left

Waist, right

Back, left

Back, right

Neck, left

Neck, right

Head, left

Head, right

Face, left

Face, right

Hand, left

Hand, right

Foot, left

Foot, right

Other

*Total quantity of simulant picked up on jacket, trousers, and gloves.
sepic-up factor equals percent of the ground contamination picked up on the uniform per meter of universal.

CONFIDENTIAL

2

TABLE 7

17 March 1958

	P	U	H	I	L	S
East Suburbs	69		69		70	67
Stoughton (In.)	135	78	135	65	135	135
Weight (lbs.)	135	135	135	150	150	150
Uniform No.	31	62	13	79	60	73
Contamination Density (cc./sq.in.)	61.58	5.59	6.18	5.53	4.15	4.15
Perforations (No.)	1180	1350	1775	1300	1300	1300
Estimated Time (min. - sec.)	1-40	1-20	1-20	2-20	2-20	2-20

Simulant Placed up (fe.) on Various Sections of Uniform

Location of Pin-Up

Simulant Picked up (mg.) on Various Sections of Uniform

Location of Pick-Up

	12	13	3	7	7	11	52	72	73
Chest, left	12	0	3	7	7	11	52	72	73
Chest, right	12	0	3	7	7	11	52	72	73
Upper abdomen, left	12	35	125	151	151	115	113	223	113
Upper abdomen, right	11	31	112	151	151	115	113	223	113
Upper arm, left	33	33	30	2	2	1	2	1	1
Upper arm, right	5	5	3	10	10	0	0	11	11
Elbow, left	278	278	302	191	191	174	174	85	85
Elbow, right	151	151	151	176	176	120	120	105	105
Forearm, left	69	69	90	11	11	11	11	11	11
Forearm, right	32	32	91	52	52	0	60	19	19

IT'S ALL ABOUT

Lower Abdomen, left	125	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800	1850	1900	1950	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500	2550	2600	2650	2700	2750	2800	2850	2900	2950	3000	3050	3100	3150	3200	3250	3300	3350	3400	3450	3500	3550	3600	3650	3700	3750	3800	3850	3900	3950	4000	4050	4100	4150	4200	4250	4300	4350	4400	4450	4500	4550	4600	4650	4700	4750	4800	4850	4900	4950	5000	5050	5100	5150	5200	5250	5300	5350	5400	5450	5500	5550	5600	5650	5700	5750	5800	5850	5900	5950	6000	6050	6100	6150	6200	6250	6300	6350	6400	6450	6500	6550	6600	6650	6700	6750	6800	6850	6900	6950	7000	7050	7100	7150	7200	7250	7300	7350	7400	7450	7500	7550	7600	7650	7700	7750	7800	7850	7900	7950	8000	8050	8100	8150	8200	8250	8300	8350	8400	8450	8500	8550	8600	8650	8700	8750	8800	8850	8900	8950	9000	9050	9100	9150	9200	9250	9300	9350	9400	9450	9500	9550	9600	9650	9700	9750	9800	9850	9900	9950	10000
Lower Abdomen, right	125	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800	1850	1900	1950	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500	2550	2600	2650	2700	2750	2800	2850	2900	2950	3000	3050	3100	3150	3200	3250	3300	3350	3400	3450	3500	3550	3600	3650	3700	3750	3800	3850	3900	3950	4000	4050	4100	4150	4200	4250	4300	4350	4400	4450	4500	4550	4600	4650	4700	4750	4800	4850	4900	4950	5000	5050	5100	5150	5200	5250	5300	5350	5400	5450	5500	5550	5600	5650	5700	5750	5800	5850	5900	5950	6000	6050	6100	6150	6200	6250	6300	6350	6400	6450	6500	6550	6600	6650	6700	6750	6800	6850	6900	6950	7000	7050	7100	7150	7200	7250	7300	7350	7400	7450	7500	7550	7600	7650	7700	7750	7800	7850	7900	7950	8000	8050	8100	8150	8200	8250	8300	8350	8400	8450	8500	8550	8600	8650	8700	8750	8800	8850	8900	8950	9000	9050	9100	9150	9200	9250	9300	9350	9400	9450	9500	9550	9600	9650	9700	9750	9800	9850	9900	9950	10000
Thigh, left	125	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800	1850	1900	1950	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500	2550	2600	2650	2700	2750	2800	2850	2900	2950	3000	3050	3100	3150	3200	3250	3300	3350	3400	3450	3500	3550	3600	3650	3700	3750	3800	3850	3900	3950	4000	4050	4100	4150	4200	4250	4300	4350	4400	4450	4500	4550	4600	4650	4700	4750	4800	4850	4900	4950	5000	5050	5100	5150	5200	5250	5300	5350	5400	5450	5500	5550	5600	5650	5700	5750	5800	5850	5900	5950	6000	6050	6100	6150	6200	6250	6300	6350	6400	6450	6500	6550	6600	6650	6700	6750	6800	6850	6900	6950	7000	7050	7100	7150	7200	7250	7300	7350	7400	7450	7500	7550	7600	7650	7700	7750	7800	7850	7900	7950	8000	8050	8100	8150	8200	8250	8300	8350	8400	8450	8500	8550	8600	8650	8700	8750	8800	8850	8900	8950	9000	9050	9100	9150	9200	9250	9300	9350	9400	9450	9500	9550	9600	9650	9700	9750	9800	9850	9900	9950	10000
Thigh, right	125	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800	1850	1900	1950	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500	2550	2600	2650	2700	2750	2800	2850	2900	2950	3000	3050	3100	3150	3200	3250	3300	3350	3400	3450	3500	3550	3600	3650	3700	3750	3800	3850	3900	3950	4000	4050	4100	4150	4200	4250	4300	4350	4400	4450	4500	4550	4600	4650	4700	4750	4800	4850	4900	4950	5000	5050	5100	5150	5200	5250	5300	5350	5400	5450	5500	5550	5600	5650	5700	5750	5800	5850	5900	5950	6000	6050	6100	6150	6200	6250	6300	6350	6400	6450	6500	6550	6600	6650	6700	6750	6800	6850	6900	6950	7000	7050	7100	7150	7200	7250	7300	7350	7400	7450	7500	7550	7600	7650	7700	7750	7800	7850	7900	7950	8000	8050	8100	8150	8200	8250	8300	8350	8400	8450	8500	8550	8600	8650	8700	8750	8800	8850	8900	8950	9000	9050	9100	9150	9200	9250	9300	9350	9400	9450	9500	9550	9600	9650	9700	9750	9800	9850	9900	9950	10000
Lower leg, left	125	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800	1850	1900	1950	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500	2550	2600	2650	2700	2750	2800	2850	2900	2950	3000	3050	3100	3150	3200	3250	3300	3350	3400	3450	3500	3550	3600	3650	3700	3750	3800	3850	3900	3950	4000	4050	4100	4150	4200	4250	4300	4350	4400	4450	4500	4550	4600	4650	4700	4750	4800	4850	4900	4950	5000	5050	5100	5150	5200	5250	5300	5350	5400	5450	5500	5550	5600	5650	5700	5750	5800	5850	5900	5950	6000	6050	6100	6150	6200	6250	6300	6350	6400	6450	6500	6550	6600	6650	6700	6750	6800	6850	6900	6950	7000	7050	7100	7150	7200	7250	7300	7350	7400	7450	7500	7550	7600	7650	7700	7750	7800	7850	7900	7950	8000	8050	8100	8150	8200	8250	8300	8350	8400	8450	8500	8550	8600	8650	8700	8750	8800	8850	8900	8950	9000	9050	9100	9150	9200	9250	9300	9350	9400	9450	9500	9550	9600	9650	9700	9750	9800	9850	9900	9950	10000
Lower leg, right	125	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800	1850	1900	1950	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500	2550	2600	2650	2700	2750	2800	2850	2900	2950	3000	3050	3100	3150	3200	3250	3300	3350	3400	3450	3500	3550	3600	3650	3700	3750	3800	3850	3900	3950	4000	4050	4100	4150	4200	4250	4300	4350	4400	4450	4500	4550	4600	4650	4700	4750	4800	4850	4900	4950	5000	5050	5100	5150	5200	5250	5300	5350	5400	5450	5500	5550	5600	5650	5700	5750	5800	5850	5900	5950	6000	6050	6100	6150	6200	6250	6300	6350	6400	6450	6500	6550	6600	6650	6700	6750	6800	6850	6900	6950	7000	7050	7100	7150	7200	7250	7300	7350	7400	7450	7500	7550	7600	7650	7700	7750	7800	7850	7900	7950	8000	8050	8100	8150	8200	8250	8300	8350	8400	8450	8500	8550	8600	8650	8700	8750	8800	8850	8900	8950	9000	9050	9100	9150	9200	9250	9300	9350	9400	9450	9500	9550	9600	9650	9700	9750	9800	9850	9900	9950	10000

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	187	117	95	136	29	148	72	64	72
Left	169	200	107	128	27	148	72	115	108
Right									
Miscellaneous									
Ratio		20	8	19	5	9	11	9	13

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NOTE: Terrain covering consisted of dead, dry, matted grass.

total quantity of a pollutant present in an ambient

without quantity of a substance picked up on the uniform per meter of traversal.

CONFIDENTIAL

17 March 1958

CRISP AND CHAML FULL NO. 7									
17 March 1958									
Location of Pick-up									
Standard Picked up (mg.) on Various Sections of Uniforms									
Jacket									
Chest, left	69	68	75	69	68	70	67	70	70
Chest, right	175	195	195	155	155	180	155	160	160
Upper Abdomen, left	31	62	13	75	75	80	65	65	65
Upper Abdomen, right	6,16	1,58	5,79	5,89	6,18	5,57	4,45	4,45	4,45
Upper Arm, left	1180	1180	12,75	12,75	12,75	13,50	12,00	12,00	12,00
Upper Arm, right	1-0	1-0	1-0	1-0	1-0	5-20	3-0	3-0	3-0
Elbow, left	1-0	1-0	1-0	1-0	1-0	5-20	3-0	3-0	3-0
Elbow, right	1-0	1-0	1-0	1-0	1-0	5-20	3-0	3-0	3-0
Forearm, left	1-0	1-0	1-0	1-0	1-0	5-20	3-0	3-0	3-0
Forearm, right	1-0	1-0	1-0	1-0	1-0	5-20	3-0	3-0	3-0
Trousers									
Lower Abdomen, left	125	112	200	71	32	137	24	119	119
Lower Abdomen, right	127	200	127	136	27	72	65	72	72
Thigh, left	104	113	4	25	25	113	59	59	59
Thigh, right	79	113	74	54	11	54	52	52	52
Knee, left	354	270	259	54	11	67	58	58	58
Knee, right	119	118	77	172	16	66	67	67	67
Lower Leg, left	86	43	113	140	2	28	53	53	53
Lower Leg, right	65	36	37	17	1	16	14	14	14
Gloves									
Left	127	112	75	136	29	118	64	72	72
Right	129	200	127	138	27	118	115	108	108
Miscellaneous									
Shirts									
Underwear									
Cuff, left	114	112	125	136	5	11	9	13	13
Cuff, right	114	112	125	136	5	11	9	13	13
Skin	9,7	10,0		0,6	1,0	0,9	1,2		
TOTAL	2311	2285	1871	1378	1,73	1102	1301	1334	1334
Pick-up factors	0,749	0,710	0,636	0,669	0,605	0,739	0,584	0,554	0,554
RESULTS:									
NOTE: Terrain covering consisted of dead, dry, sated grass.									
Critical quantity of shuliant picked up on jacket, trousers, and gloves.									
Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of traversal.									

CONFIDENTIAL

11 April 1958

ORIGINAL NOTED

TABLE 3

ORANGE AND GRAY UNIFORM NO. 8

Test Subject	P	G	F	B	D	A	R	I	Q
Height (in.)	68	75	70	69	67	71	67	65	70
Weight (lbs.)	195	195	180	185	185	185	180	180	160
Uniform No.	160	195	59	185	34	36	33	37	22
Contamination Density (g./sq. in.)	2.38	2.33	2.13	2.58	2.53	2.45	2.03	2.03	2.08
Particle Size (u. in.)	9.0	9.0	10.0	9.0	9.0	9.0	9.0	9.0	9.0
Traversal Time (in. - sec.)	1-10	1-10	2-15	2-30	2-20	3-12	2-30	2-30	2-30
Simulant picked up (wt.) on Various Sections of Uniforms									
Location of Pick-up									
Jacket									
Chest, left	20	13	23	16	19	16	35	13	11
Chest, right	6	0	20	1	8	6	9	6	12
Upper Abdomen, left	87	53	132	16	117	130	76	30	140
Upper Abdomen, right	295	36	66	19	28	92	51	56	60
Upper Arm, left	53	16	25	6	23	16	10	8	6
Upper Arm, right	11	12	13	19	12	14	8	11	11
Elbow, left	130	92	110	68	93	158	89	79	105
Elbow, right	76	79	110	117	53	111	85	70	111
Forearm, left	67	60	13	12	55	61	83	61	70
Forearm, right	79	69	106	12	37	71	67	83	63
Trousers									
Lower abdomen, left	286	113	101	100	134	116	77	20	216
Lower abdomen, right	50	139	59	70	81	116	93	13	11
Thigh, left	185	66	71	27	47	195	100	17	93
Thigh, right	188	64	50	67	21	98	62	22	16
Knee, left	131	67	64	64	64	231	106	63	118
Knee, right	131	67	64	64	64	193	65	71	13
Lower leg, left	135	103	114	35	39	88	70	24	106
Lower leg, right	272	10	16	31	1	43	35	16	74
Gloves									
Left	79	50	34	63	107	89	67	70	54
Right	166	27	117	144	91	230	94	69	115
Miscellaneous									
Knife	17	15	11	13	24	25	14	28	28
Underwear									
Cuff, left	38	38				0.2	0.7	2.2	10.8
Cuff, right	3.2	3.2	0.4	0.2	1.0	0.2	17.0	3.1	5.2
Elbow	0.3	0.3				0.7	1.6	1.2	
Wrist	0.5	0.5	0.2	0.6	0.6				
Thighs			0.2	1.4	0.1	0.3	0.1	0.2	
Skin	0.4	3.5	0.2						
Foot	21.8	10.2	11.0	10.4	12.6	19.1	12.7	7.6	11.64
Foot	1.816	1.024	1.380	0.829	0.939	1.622	1.288	0.784	1.108
Pick-up Factors									

Total quantity of simulant picked up on jacket, trousers, and gloves.

Reference factor equals percent of the dry or contamination picked up on the uniform for each of the various

14 April 1968

TABLE B
DEEP AND CRUEL TRAIL NO. 3

	P	C	E	B	D	A	F	I	Q
Test Subject	68	75	70	69	67	72	67	65	70
Weight (lbs.)	175	175	180	155	185	175	180	150	160
Uniform No.	39	39	59	4	34	152	33	37	22
Contamination Density (g./sq.in.)	2.38	2.34	2.13	2.59	2.59	2.15	2.03	2.03	2.08
Particle Size (u, MO)	940	940	1100	940	940	940	940	890	890
Traversal Time (min. - sec.)	4-10	4-10	2-15	2-30	2-20	3-10	2-30	5-15	5-15
Simulant Pick-up (%) on Various Sections of Uniforms									
Location of Pick-up									
Jacket									
Chest, left	20	15	23	16	19	16	35	13	14
Chest, right	6	0	20	1	8	6	9	1	12
Upper Abdomen, left	295	23	132	156	110	130	76	30	120
Upper Abdomen, right	51	28	66	1	28	92	51	9	60
Upper Arm, left	11	12	13	19	12	16	10	56	6
Upper Arm, right	18	92	115	62	93	158	89	6	11
Shoulder, left	12	12	117	117	53	111	85	79	105
Shoulder, right	67	78	143	71	55	61	93	61	75
Forearm, left	79	49	106	12	37	71	67	83	45
Forearm, right									
Trousers									
Lower Abdomen, left	286	113	101	109	184	115	77	20	216
Lower Abdomen, right	50	139	59	70	61	116	93	13	11
Thigh, left	175	66	71	77	47	152	160	17	93
Thigh, right	88	14	50	67	21	182	149	22	16
Knee, left	131	97	123	61	24	231	166	71	118
Knee, right	42	57	51	14	32	123	65	24	113
Lower Leg, left	115	103	127	31	25	96	70	24	106
Lower Leg, right	272	16	17	31	31	43	35	16	74
Gloves									
Left	77	59	34	42	127	59	62	70	54
Right	17	37	17	11	94	239	94	69	115
Miscellaneous									
Rifle	17	15	11	13	24	25	14		28
Footwear									
Left, left	20	38							
Left, right	0.3	3.2			1.0	0.2	0.7	2.2	12.8
Shoelace						0.2	1.0	1.1	5.2
Thigh	0.5				0.6			1.2	
Skin	0.1	1.6	0.2	1.0	0.1	0.3	0.1	0.2	0.2
TOTAL*	2198	1212	1170	1574	1216	1371	1777	736	1404
Pick-up Factors**	1.816	1.024	1.250	0.909	0.239	1.622	1.258	0.794	1.105

*Total quantity of simulant picked up on jacket, trousers, and gloves.

**Pick-up factor equals percent of the total contamination picked up on the uniform or other of traversal.

Remarks:

2

CONFIDENTIAL

TABLE 2

REPORT AND CHEM. ANAL. NO. 2

17 April 1958

Test Subject	8	6	5	7	4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218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17 April 1958

CREEP AND CRIME, TRIAL NO. 2

Test Subject:
Height (in.) 69
Weight (lbs.) 155
Uniform No. 3
Contamination Band V (cc./sq. ft.) 13.6
Particle Size (µm) 25.10
Particle Shape (µm) 25.10
Particle Density (g./cc.) 3.55

Location of Picked-up

Simulant Picked up (µg.) on Various Sections of Uniform

Notes

Chin, left
Chest, right
Upper abdomen, left
Upper abdomen, right
Upper arm, left
Upper arm, right
Elbow, left
Elbow, right
Forearm, left
Forearm, right

Findings

Lower abdomen, left
Lower abdomen, right
Thigh, left
Thigh, right
Knee, left
Knee, right
Lower leg, left
Lower leg, right

Other

Left
Right

Miscellaneous

Rifle

Underwear

Cuff, left
Cuff, right
Sleeve
Ankle
Shin

TOTALS

Pick-up Factor

REMARKS

Total quantity of simulant picked up on jacket, trousers, and shoes.
Pick-up factor equals percent of the ground contamination picked up on the uniform per meter of interval.

CONFIDENTIAL

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TABLE 10

CNSP AND CRAM TRIAL NO. 10

15 May 1953

Test Subject	H	J	D	F	G	I	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	IJ	JK	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TT	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	YG	YH	YI	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	IJ	JK	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TT	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	YG	YH	YI	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	IJ	JK	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TT	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	YG	YH	YI	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW
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TABLE 10

CREW AND CRIME TRIAL NO. 10

Test Subject	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Height (in.)	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
Weight (lb.)	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175
Uniform No.	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
Contamination Density (g./sq.m.)	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
Particle Size (μ, 50%)	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
Transverse Flow (liters - sec.)	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30	3-30

Location of Pick-up

Simulant Picked up (mg.) on Various Sections of Uniforms

Jacket	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Chest, left	38	112	118	19	0	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Chest, right	26	35	35	27	0	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Upper Abdomen, left	73	98	101	17	0	98	98	98	98	98	98	98	98	98	98	98	98	98	98
Upper Abdomen, right	42	26	38	12	0	26	26	26	26	26	26	26	26	26	26	26	26	26	26
Upper Arm, left	10	47	47	8	0	47	47	47	47	47	47	47	47	47	47	47	47	47	47
Upper Arm, right	3	24	35	13	0	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Elbow, left	88	217	217	115	0	217	217	217	217	217	217	217	217	217	217	217	217	217	217
Elbow, right	11	71	86	52	0	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Forearm, left	24	108	111	66	0	108	108	108	108	108	108	108	108	108	108	108	108	108	108
Forearm, right	22	44	57	33	0	44	44	44	44	44	44	44	44	44	44	44	44	44	44
Trousers																			
Lower Abdomen, left	38	93	93	24	133	93	93	93	93	93	93	93	93	93	93	93	93	93	93
Lower Abdomen, right	32	42	42	21	92	42	42	42	42	42	42	42	42	42	42	42	42	42	42
Right, left	28	52	52	86	69	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Right, right	38	45	45	86	40	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Knee, left	64	66	66	73	52	66	66	66	66	66	66	66	66	66	66	66	66	66	66
Knee, right	122	15	37	63	36	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Lower Leg, left	59	30	34	25	11	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Lower Leg, right	0	26	34	17	12	26	26	26	26	26	26	26	26	26	26	26	26	26	26
Slaves																			
Left	71	127	26	39	48	127	127	127	127	127	127	127	127	127	127	127	127	127	127
Right	115	139	185	177	86	139	139	139	139	139	139	139	139	139	139	139	139	139	139
Wise Flowers																			
Right	6	5	4	4	0.3	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Underwear																			
Cuff, left	54	17	17	12.9	0.3	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Cuff, right																			
Elbow																			
Skin																			
TOTAL	853	1,041	1,166	1,106	922	1,166	1,166	1,166	1,166	1,166	1,166	1,166	1,166	1,166	1,166	1,166	1,166	1,166	1,166
Pick-up Factors*	1.176	1.177	1.176	1.177	1.175	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176

REMARKS:

NOTE: Trial was performed on damp terrain.

*Pick-up factor equals percent of the ground contamination picked up on the uniform as a factor of traversal.

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*Total quantity of cement picked up on foot, in cars, in trucks.

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Armed Services Technical Information Agency

**ARLINGTON HALL STATION
ARLINGTON 12 VIRGINIA**

**FOR
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CONTROL ONLY**

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NOTICE: WHEN GOVERNMENT OR OTHER DRAWINGS, SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE U. S. GOVERNMENT THEREBY INCURS NO RESPONSIBILITY, NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

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THE UNIVERSITY OF CHICAGO

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1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100

21. 2

Year	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1977	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100

4

1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100

10

[illegible]

—

[illegible]

22.6.45

Total quantity of effluent added in one batch, Q_{batch} , and given:

*Plexip factor available at the ground concentration indicated on the uniform indicator of traversal.

TABLE 22

Wegman, R. A. in *Signal-Processing*

[illegible]

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• [continued] ... and ...

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APPENDIX A

Table 13

Cooperative Pick Up on Roller and Man

Date	Test subject	Contamination density	Approx particle size	Pick-Up		
				Roller	Man	Roller/Man
19 Jun 58	A	2/84 μ 10.5	Large	3.61	3.30	1.08
19 Jun 58	A	6.95	Large	2.66	2.31	1.15
19 Jun 58	A	9.42	Large	3.85	2.84	1.36
19 Jun 58	A	2.90	Large	0.94	0.77	1.22
19 Jun 58	A	0.72	Large	0.49	0.39	1.25
19 Jun 58	A	1.44	Small	0.94	0.40	2.04
19 Jun 58	A	3.11	Small	1.20	0.99	1.21
19 Jun 58	A	5.29	Small	1.41	1.07	0.77
19 Jun 58	A	7.70	Small	3.93	2.69	1.46
19 Jun 58	A	10.4	Small	4.40	3.41	1.17
14 Apr 58	E	2.13	1100	1.90	1.47	1.29
14 Apr 58	A	2.43	1000	1.07	1.37	1.05
14 Apr 58	A	2.08	700	1.48	1.46	1.01
17 Apr 58	D	12.1	2500	6.48	5.06	1.28
17 Apr 58	I	9.85	2500	5.00	3.43	1.46
17 Apr 58	R	8.00	2500	3.32	3.30	1.14
15 May 58	H	1.45	700	1.09	0.85	1.28
15 May 58	G	0.81	3100	0.80	0.57	1.40
15 May 58	E	1.62	3100	1.45	1.01	1.44
28 May 58	G	0.90	600	1.24	0.77	1.61
28 May 58	H	2.53	600	3.08	2.82	1.09
28 May 58	A	0.21	600	1.32	0.63	2.09

Remarks:

1. Trials conducted on 19 Jun 58 were run in accordance with Test Plan No. 29. The other data presented were obtained in conjunction with "creep and crawl" trials.
2. Physical characteristics of test subjects appear in preceding tables.

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APPENDIX A

Table 14

Comparative Transferability of Agent and Simulant

Trial No.	Contamination density g/sq m	Particle size	Roller Pick-Up				
			First Traversal			Second Traversal	
			Top cloth	Under cloth	Ratio agent/sim*	Top cloth	Under cloth
			mg	mg		mg	mg
1	8.5	Small	2,440	23	0.68	27	1
2	13.9	Small	2,390	43	0.41	80	2
3	6.9	Small	2,530	40	0.89	17	2
4	3.6	Small	1,270	52	0.85	16	1
5	2.2	Small	250	25	0.29	10	1
6	10.0	Large	2,000	7	0.53	76	54
7	12.9	Large	1,300	23	0.25	60	59
8	8.2	Large	1,250	2	0.40	47	23
9	3.4	Large	1,100	15	0.85	18	11
10	1.0	Large	520	16	1.34	7	5

Remarks:

*In establishing the ratio of agent to simulant pick-up, corresponding values of simulant pick-up were obtained from curves in figure 3, appendix B, which were fitted to data obtained on 10 June 1953 as presented in table 13, this appendix.

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APPENDIX B

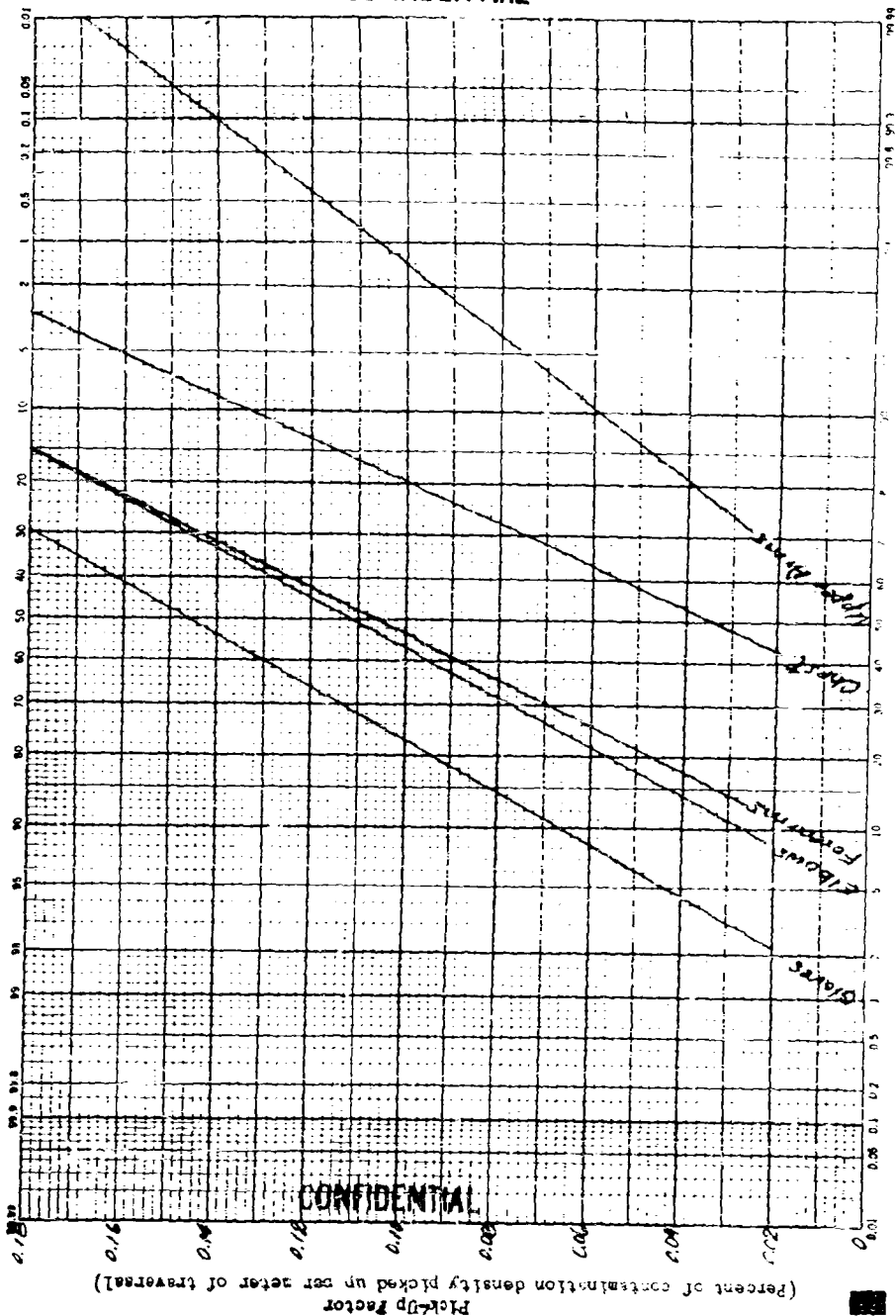
GRAPHS AND CHARTS

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Figure 2 Distribution of Simulant on Uniforms of Test Subjects.	29
Figure 3 Pick-Up of Simulant on Cloth-Covered Roller.	30
Figure 4 Comparative Transferability of Agent and Simulant.	31

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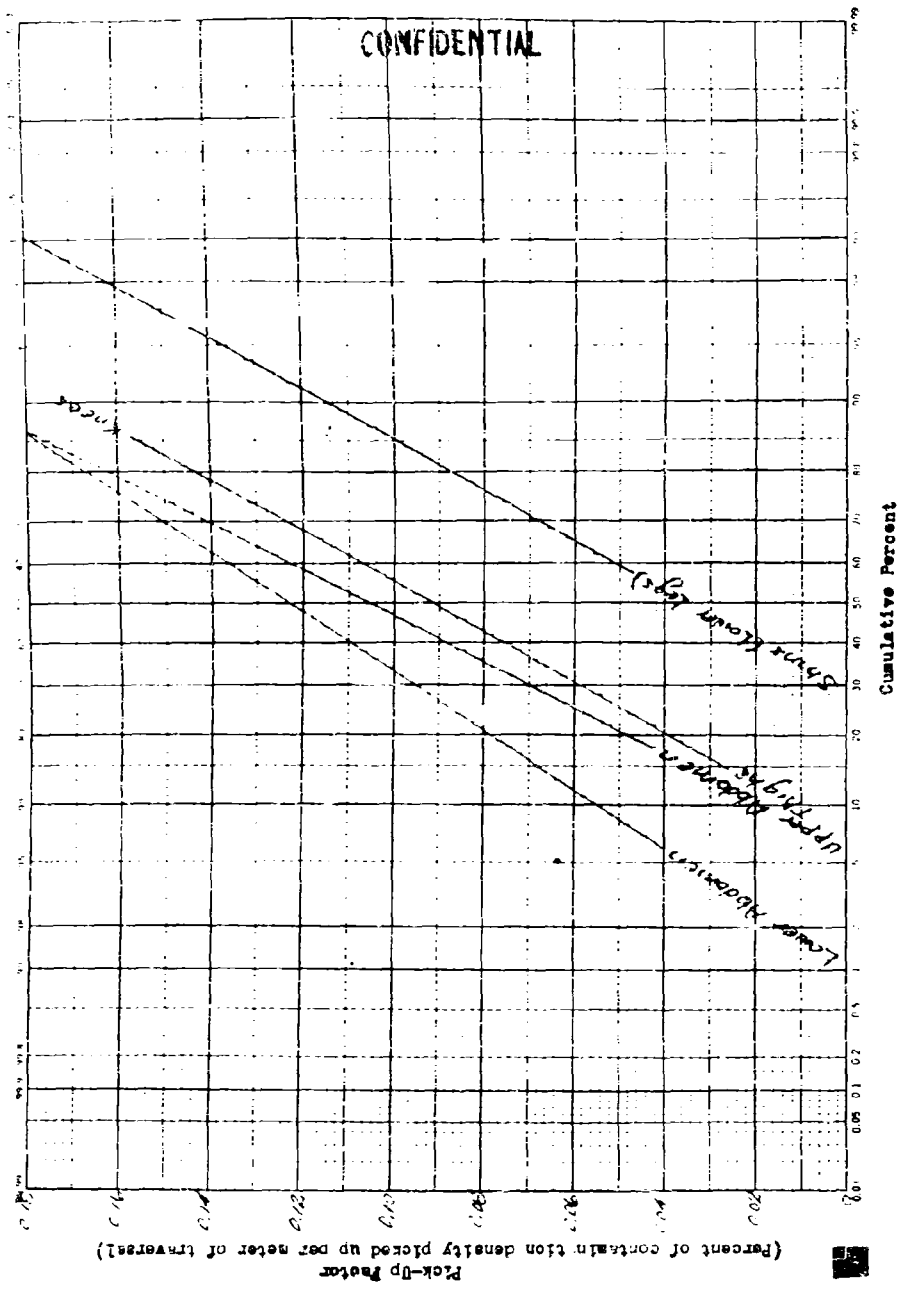
FIGURE 1
DISTRIBUTION OF SIMULANT ON UNIFORMS OF TEST SUBJECTS



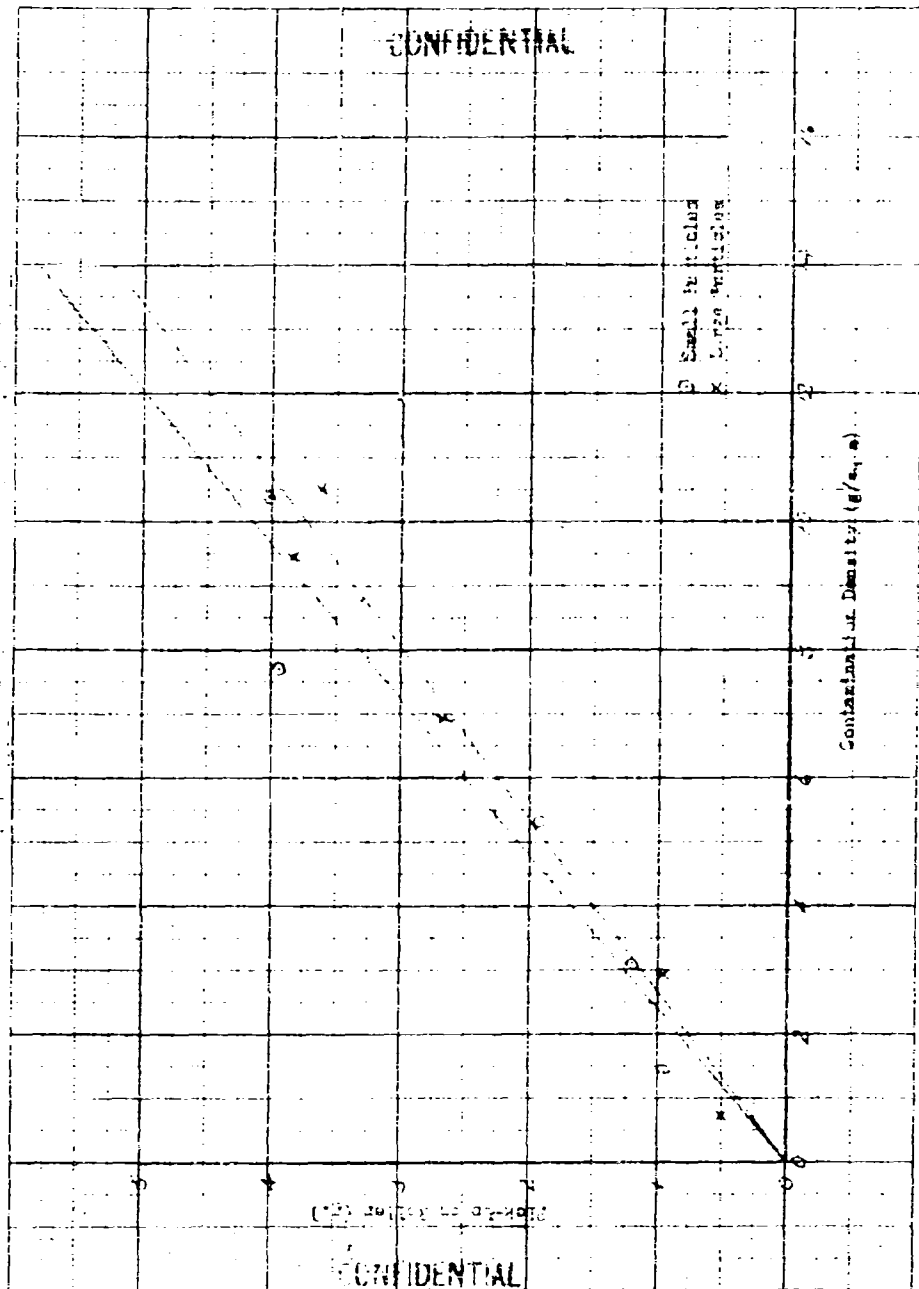
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K&E DIVISION
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FIGURE 2

FIGURE 2
DISTRIBUTION OF SIMULANT ON UNIFORMS OF TEST SUBJECTS



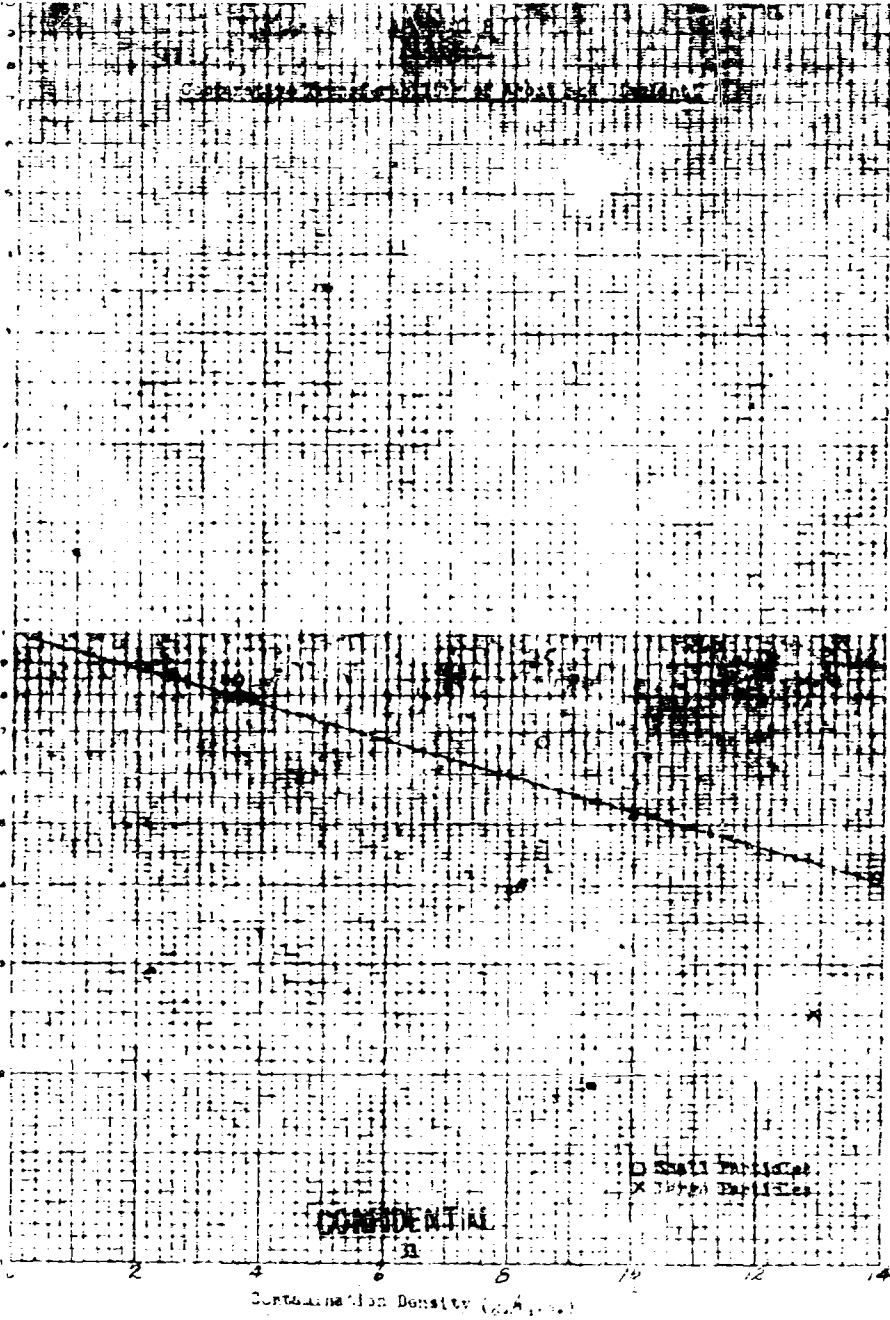
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Figure 1 - Effect of Contamination Density



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FIGURE 1

SPINNING TIP APPARATUS

View shows sled-mounted spinning tip apparatus employed in dispersing
simulant in fine droplets.

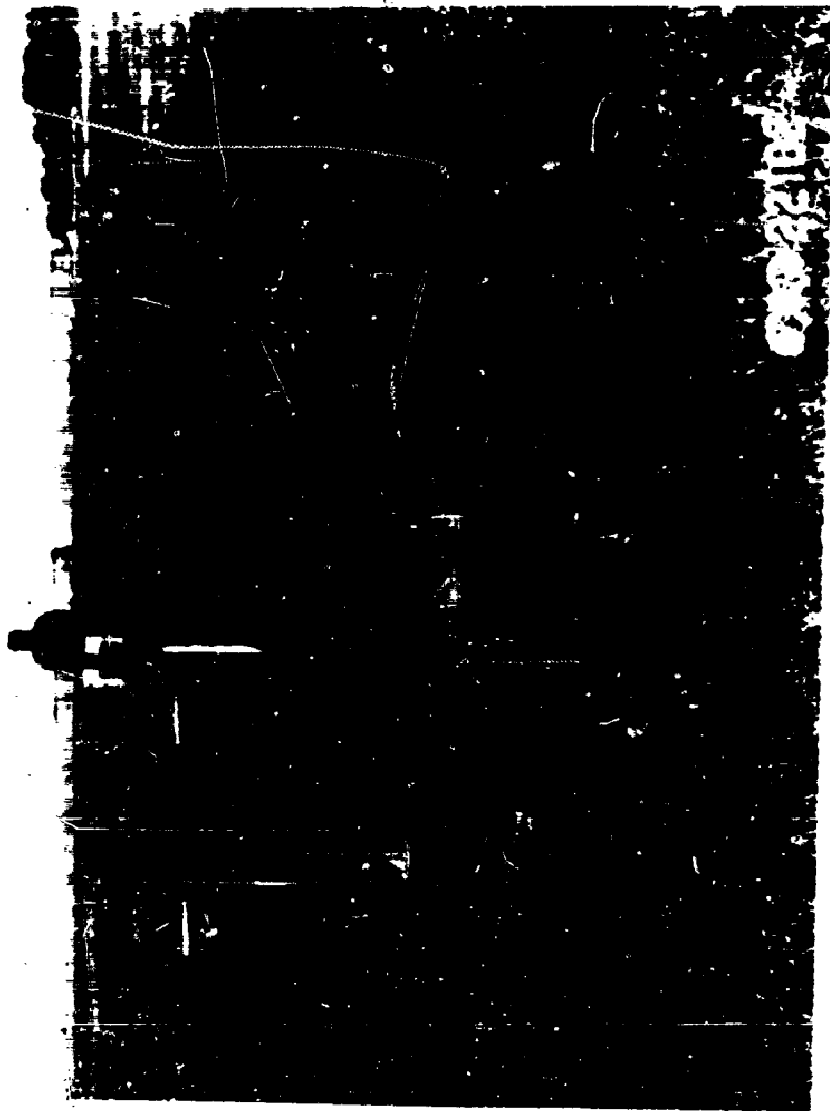


FIGURE 2

MULTIJET DISPENSER

View shows sled-mounted multijet dispenser employed in the dissemination of large droplets. The sled for the spinning the generator is seen in the background.

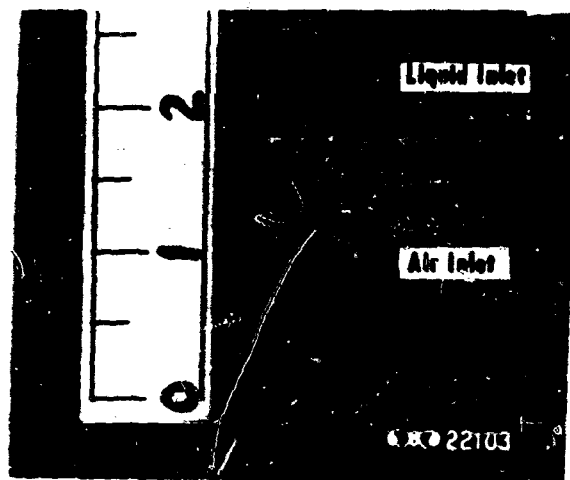
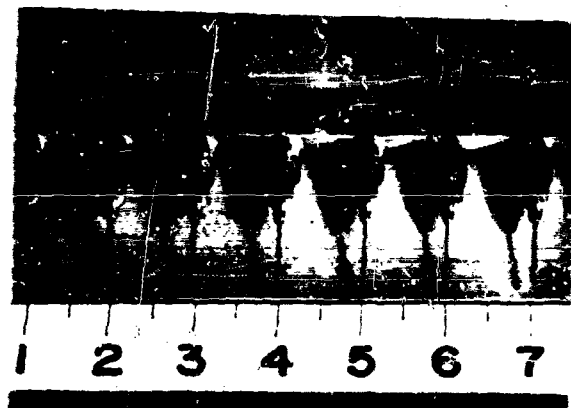


FIGURE 1

NOZZLES FOR MULTI-JET DISPERSER

Top view shows a section of the disperser manifold with needles for disseminating 3 μ droplets. Bottom view shows nozzles for disseminating shattered droplets averaging less than 0.5 μ in diameter.

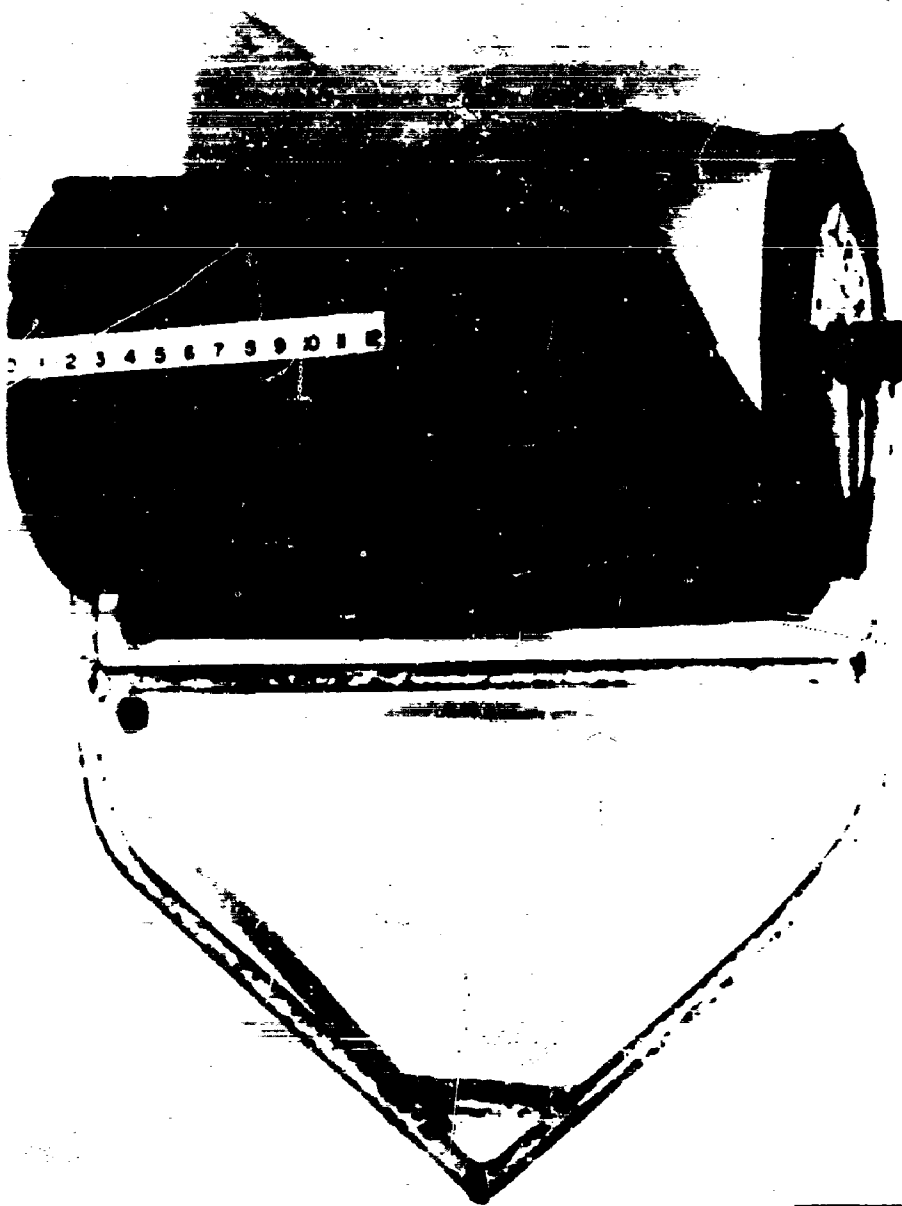


FIGURE 4

CLOTH-COVERED ROLLER

In this view the cotton sateen cover is lifted to show the 1/2-in. thick foam rubber pad covering the steel drum of the roller.

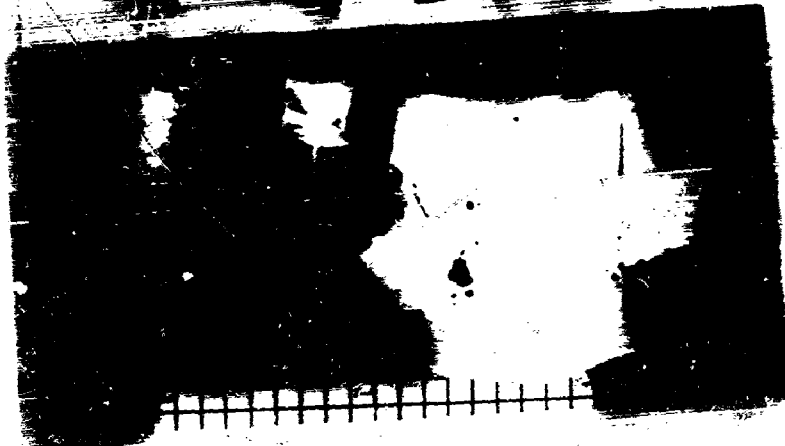
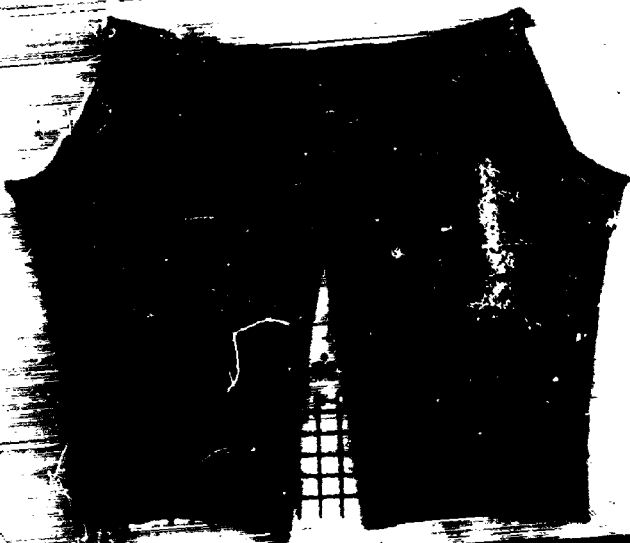


FIGURE 5
CONTAMINATED JACKET (LIGHT)



FIGURE 6
CONTAMINATE UNIFORM (SEDITE)

View shows contaminated clothing mounted on a plane surface after seams were cut.



PICTURE 7

CONTAINER 3 - TOP - (HEAVY)

View shows container, clothing and other items on surface after being more cut.

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US ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND
EDGEWOOD CHEMICAL BIOLOGICAL CENTER
5183 BLACKHAWK ROAD
ABERDEEN PROVING GROUND, MD 21010-5424

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ATTENTION OF

RDCB-DSR-S

JUL 11 2016

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FOR Defense Technical Information Center, 8725 John J. Kingman Road, Ft Belvoir, VA 22060

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RONALD L. STAFFORD
Security Manager

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